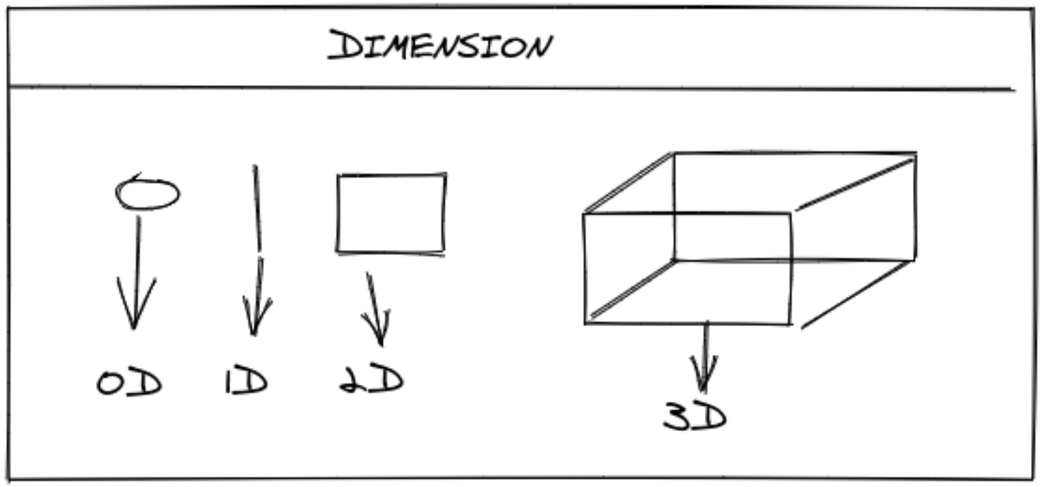
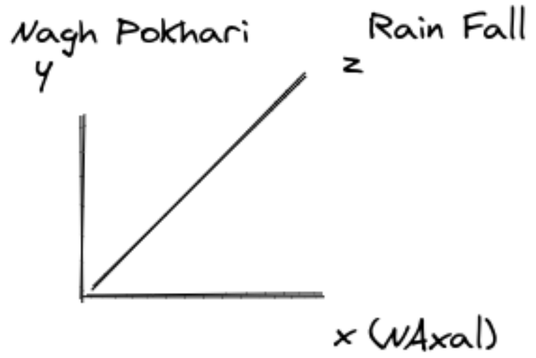
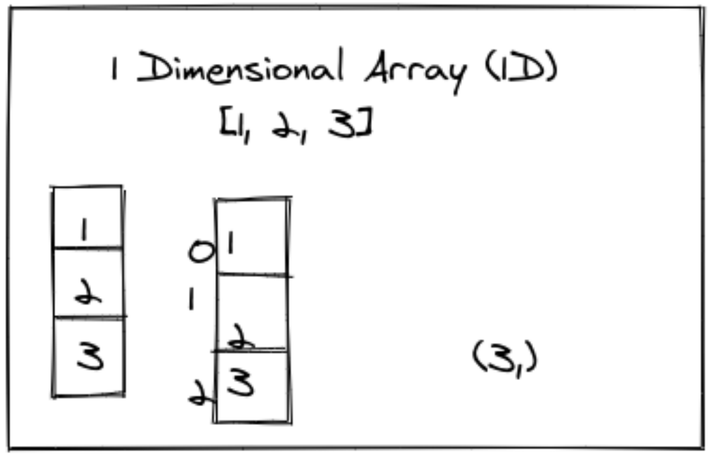
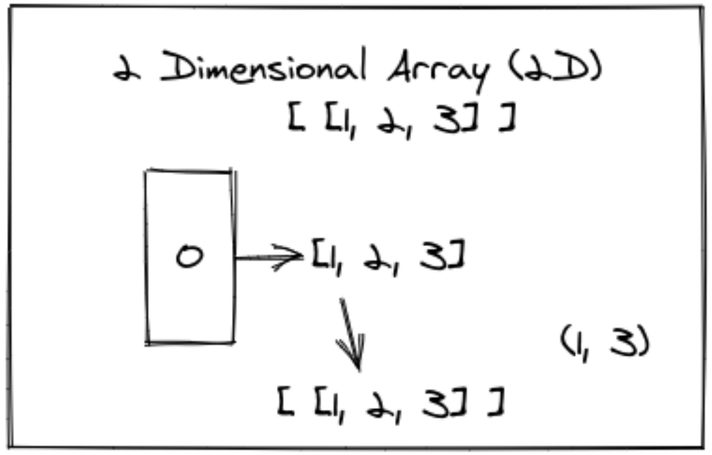
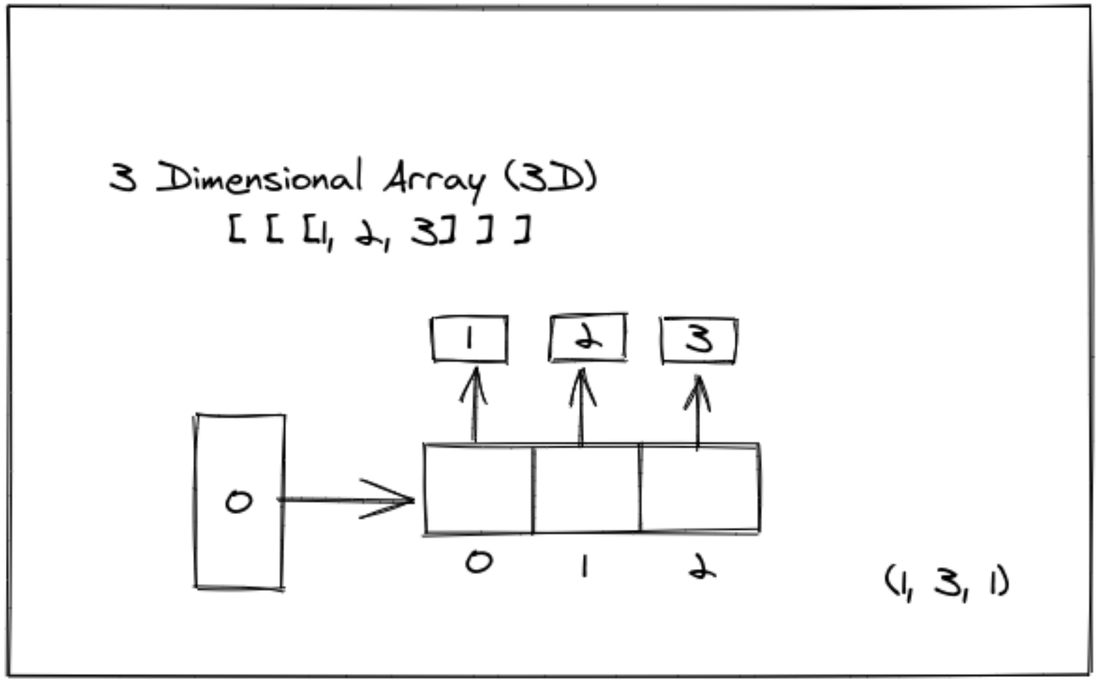
01


DIMENSION
0D
1D
2D
3D


Nagh Pokhari
Rain Fall
y
z
x (WAxal)

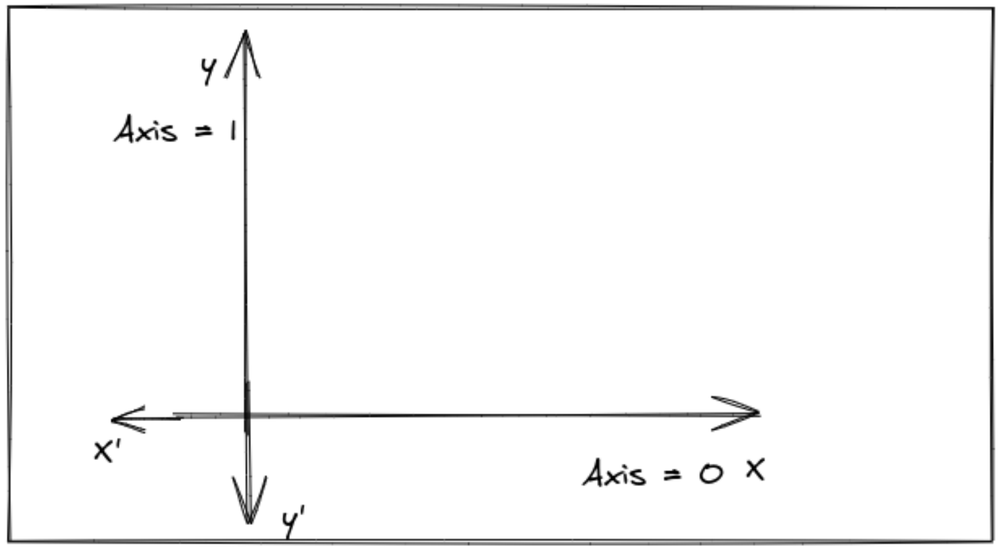

1 Dimensional Array (1D)
[1, 2, 3]
1
2
3
0
1
2
1
2
3
(3,)

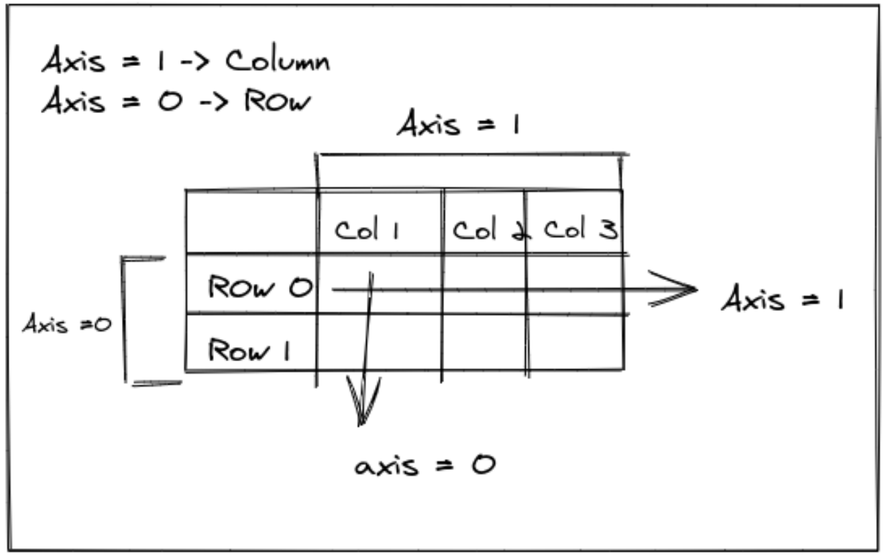

2 Dimensional Array (2D)
[[1, 2, 3]]
0
[1, 2, 3]
(1, 3)
[[1, 2, 3]]

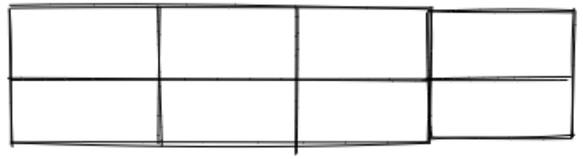

3 Dimensional Array (3D)
[[[1, 2, 3]]]
1
2
3
0
0
1
2
(1, 3, 1)

02

AXIS 0 and Axis 1





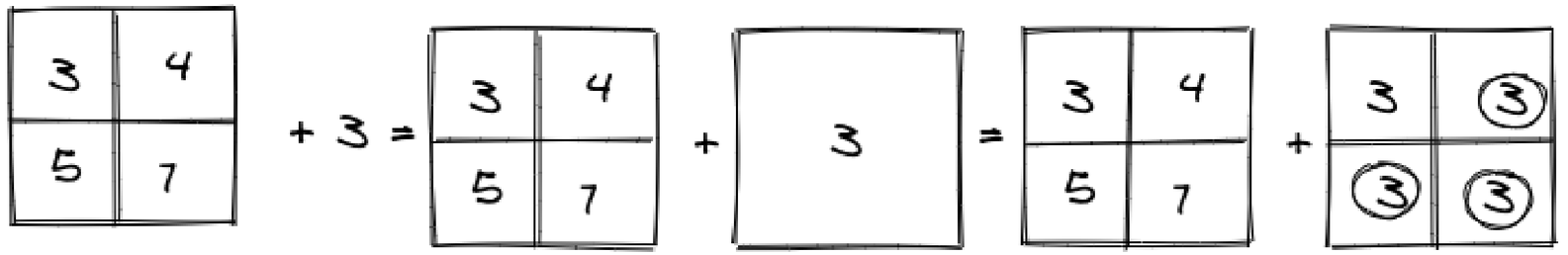


Horizonatal(Axis = 0) — Row

Vertical Axis = 1 — Column

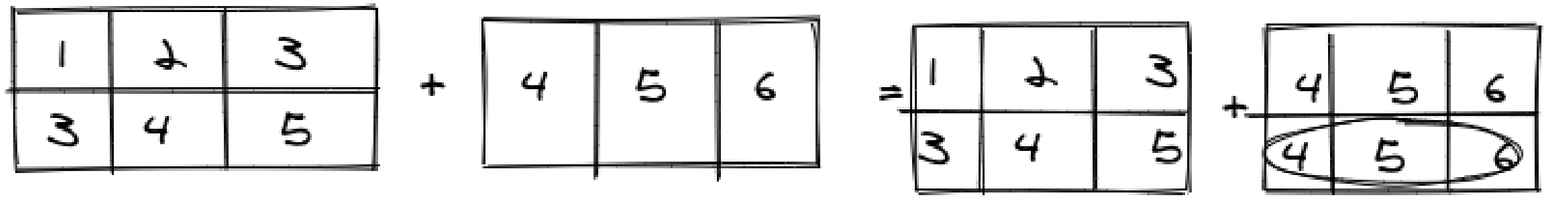
03

Broadcasting



Example 01

6	7
8	10

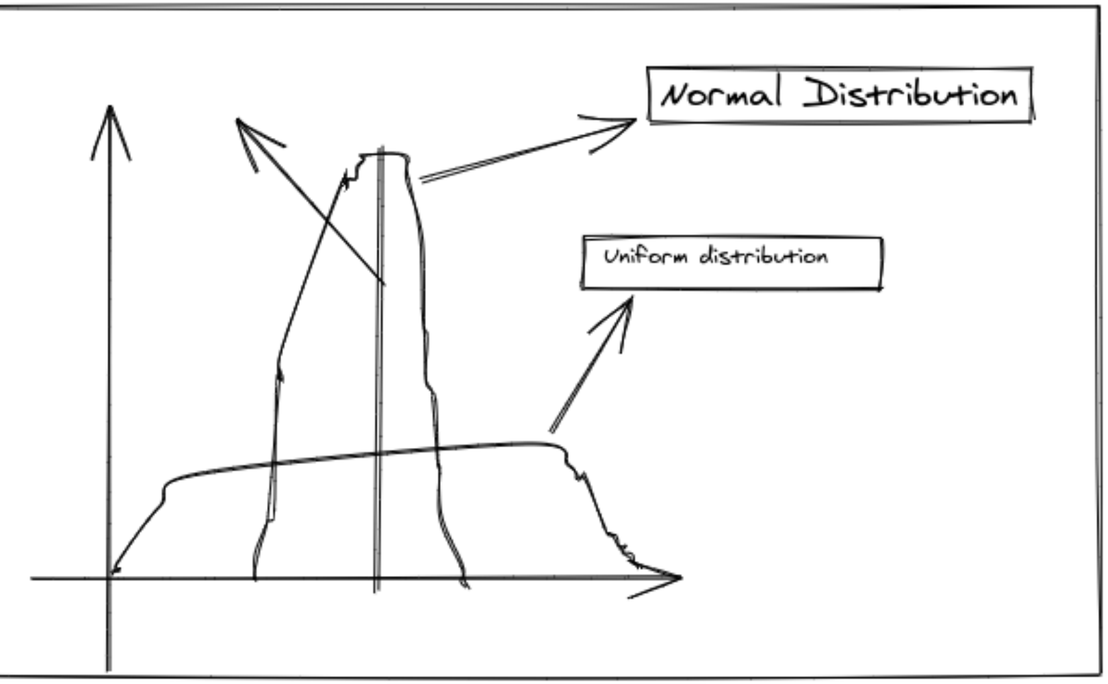


Example 02

5	7	9
7	9	11

04

Normal and Uniform DIstribution



Mean, Median, Variance, Standard Deviation

$$\text{Mean} = \frac{\sum_{i=1}^{n} x'}{n}$$

$$\text{variance} = \frac{\sum_{i=1}^{n} (x-x')^2}{2}$$

$$SD = \sqrt{\frac{\sum_{i=1} (x-x')^2}{2}}$$

For odd

Median = x1 , x2 , x3, x4, x5

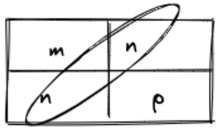
Median = x3

Median = x1 , x2 , x3, x4, x5, x6

$$\text{Median} = \frac{x3 + x4}{2}$$

05

Matrix Multiplication Rules



= m * p

if Matrix A = m * n
and Matrix B should be = n * p

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} @ \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} @ \begin{bmatrix} 5 \\ 7 \end{bmatrix} \quad \begin{matrix} 6 \\ 8 \end{matrix}$$

$$= \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} @ \begin{bmatrix} 5 \\ 7 \end{bmatrix} \quad \begin{matrix} 6 \\ 8 \end{matrix} \Big/ \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} @ \begin{matrix} 5 \\ 7 \end{matrix} \quad \begin{matrix} 6 \\ 8 \end{matrix}$$

$$= \begin{bmatrix} 1*5+2*7 & 1*6+2*8 \\ 3*5+4*7 & 3*6+4*8 \end{bmatrix}$$

$$= \begin{bmatrix} 19 & 22 \\ 43 & 50 \end{bmatrix}$$

Element Wise multiplication

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \times \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \times \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$$

$$= \begin{bmatrix} 1 \times 5 & 2 \times 6 \\ 3 \times 7 & 4 \times 8 \end{bmatrix}$$

$$= \begin{bmatrix} 5 & 8 \\ 21 & 32 \end{bmatrix}$$